

# Designing Nonwoven Medical Aids Using Natural Medical Finish for Asthma Patients

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## **ABSTRACT**

*Smog hanging over cities is the most obvious form of air pollution. Air pollutant is the material in the air that has adverse affect on humans and ecosystem. The pollutants can be solid particles, liquid particles or gaseous particles of natural or manmade in origin. Pollutants can be primary or secondary, which includes carbon monoxide gas from vehicles, exhaust or sulfur dioxide from factories. Study's show that air pollution can worsen asthma symptoms. Some particles can pass through nose or mouth and reach lungs. Both long term and short-term exposure can cause health problems such as lung functions. To get rid of all asthma problems the patients rely on facemasks. In this study such a facemask is taken and treated with natural herbal finish and was analyzed with laboratory test, chemical test and questionnaires.*

**Keywords:** *Air pollution, Asthma patients, Herbal finish, Facemask*

## **Introduction**

People with asthma states that poor air quality makes their asthma worsen and make them at a higher risk of asthma attack. Pollution will make the asthma patients more sensitive and more likely to trigger the asthma. Children and young adults with asthma are more at risk of asthma because they have faster breathing rates. Older people find it harder to cope with pollution since they have underlying chronic obstructive pulmonary disease.

Being exposed to persistent and highly concentrated pollution can cause severe breathing difficulties in the patient. To have a temporary solution doctors will advise the patient to use face masks made of nonwovens. The facemask will be given a natural finish. Finishing is a general term for the process of treatment which a fabric may undergo after it has been made. This study has given a solution for the betterment of the problems. There are so many finishes to be given to face mask's which are used by asthma patients. In this study a combination of oregano, basil leaves, mint herb, ginger and eucalyptus have been used as a herbal finish. All the herbs which have been used has so many medical properties which helps the asthma patients to get a relief from their suffocation. After the treatment the properties of the fabric will be analyzed by so many tests.

## **Methods and Methodologies**

The experimental procedure pertaining the study is discussed under the following headings

- 1 Selection of raw material
- 2 Construction of the sample
- 3 Method of application
- 4 Testing of the finishes applied

## **Selection of raw material**

### **Fabric selection**

The fabrics are of different types it can be selected according to the end uses of the product and also design. For this particular study the type of the fabric selected is based on the three main factors. Eco friendliness, economical and requirement

Depending on the above factors the fabric are selected is Nonwovens

Nonwovens are fiber-based products it can be made from variety of natural and synthetic fibers. Nonwovens are mostly used in the medical applications. They have more absorbency and also having a sterilized fabric strength, and easily disposable fabric..

Non-woven fabrics are broadly defined as sheet or web structures bonded together by entangling fiber mechanically, thermally or chemically.

### **Selected non-woven fabric**

The non-woven material is selected for constructing facemask for asthma patients. For face mask 2 meters of non-woven fabric can be purchased. This selected non-woven has good air permeability and less moisture strength.

## **Construction of sample**

### **Non-woven facemask**

The non-woven asthma facemask constructed for asthma patients. When they wearing Non-woven facemask they can be able to breath easily. These facemask are 3 ply face mask, in those there are 2 different styles. One is knotting facemask and other one is loop type. Both the type of facemask is constructed by a 3 ply structure. The GSM of 25 is used to make a non-woven asthma facemask. It can be worn in the face by covering nose and mouth.

## **Application of the finish**

The study is mainly objected to the application of herbal on the finished products (face mask). This process is termed as finishes and for the particular studies the following methods are widely applicable

### **Exhaustion method**

This method applied for the particular study is exhaustion method, which is completely wash type process. For the application of herbal finishes on to garments require a complete dipped process. This basically means that the herbals will get evenly all over fabric only through dip process. The application of herbals on the fabric primarily includes the testing of PH value test. This test is specified to check whether the fabric is having a complete application of finishes.

## **Method**

For all the above said herbal forms similar experimental methods is repeated and applied to samples and explained step by step process below

### **Nonwoven sample preparation**

The blended fabric (75 % cotton and 25% polyester) is laid. The fabric will be sheared according to the length and width of the sample masks after that it can be

constructed. The masks are prepared with certain measurements suitable for various age groups.

### Solvent preparations

First the herbal leaves are taken that includes 10 gm. of oregano herb 10 gm. of basil herb, 10gm. of mint herb, 10gm. of ginger and 2ml of eucalyptus oil.

They will be put together and grind well. Take a 500 ml beaker, pour 200 ml water into it and add the mixture into it. Keep the beaker in the oven for 15 minutes ,filter it and finally add eucalyptus oil into it .

### PICTURES OF THE HERBS USED



OREGANO



BASIL HERB



MINT LEAVE



GINGER



EUCALPTUS

### Treating the sample with Herbal Extract

Take the non-woven fabric and put it in the solvent prepared and keep it for 10 hours. After 10 hours take the mask out and dry it for half hour and take a sample and place it in the airtight container. The pure organic mask help in release asthmatic breath and helps reduce cough in lungs.

### Testing of the finishes

#### PH Value Test

Human skin is slightly acidic in nature to inhibit bacteria growth. Textile process involving use of strong acids /alkaline with too low of high ph. may cause irritation with skin when in contact. Textile fiber should be tested for ph.

### Result and discussion

The results and discussion of study are discussed under the following topics. The test undergone on herbal finish for facemask is evaluated below.

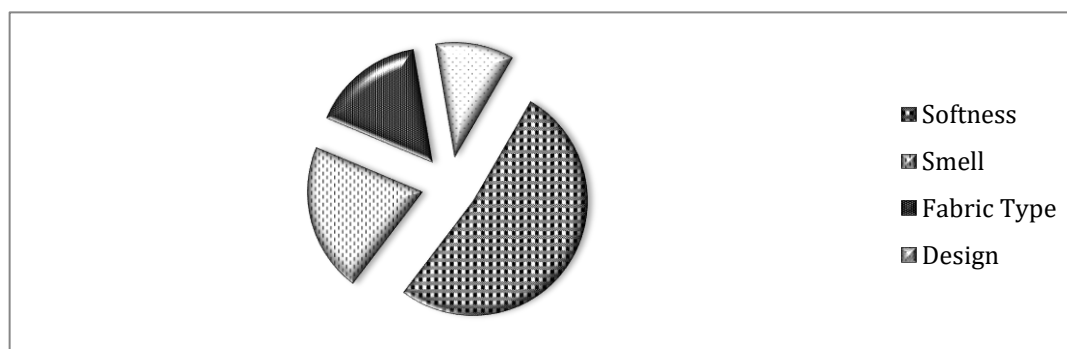
1. PH value test
2. Chemical test

#### PH VALUE TEST

PH of aqueous extract	Herbal Coated face mask
PH of aqueous extract	6.29
PH of water used	6.84

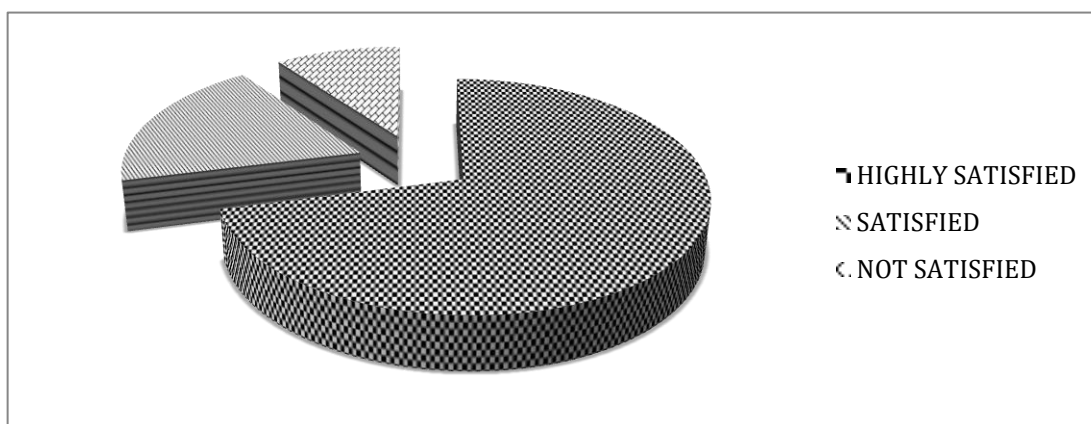
The PH value of water is 7 which is neutral for the particular skin value test 6 to 7 is denoted as neutral. Proved that the PH value is neutral.

PRIMARY FACTORS OBSERVED BY THE PARTICULARS	Percentage of Respondents
Softness	52
Smell	21
Fabric Type	16
Design	11
Total	100



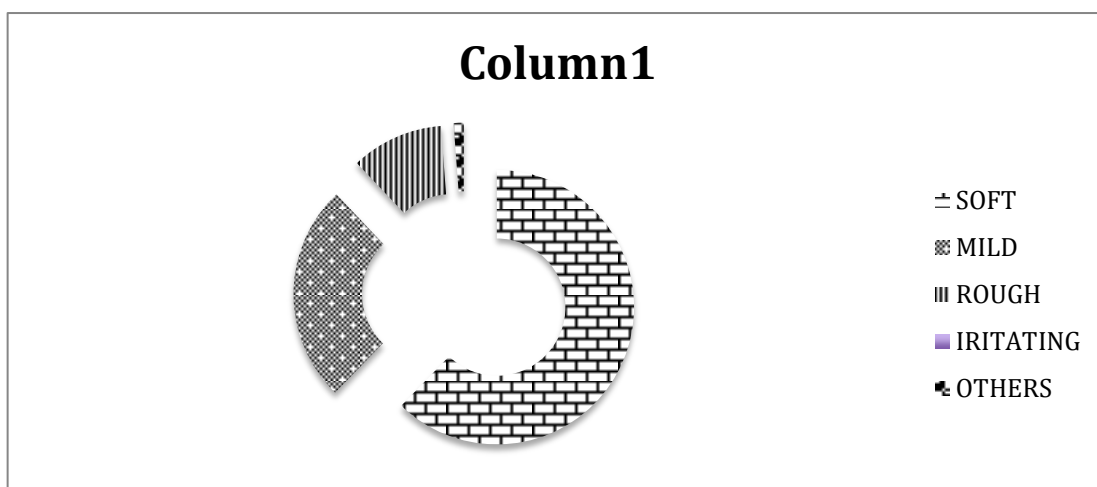
### BREATHING EFFECTS OF HERBAL FINISHED OBSERVED FROM THE RESPONDENTS

PARTICULARS	PERCENTAGE
Highly Satisfied	71
Satisfied	19
Non Satisfied	10
TOTAL	100



### SATISFACTION OF THE SAMPLE IMPARTED TO THE RESPONDENTS

PARICULARS	PERCENTAGE
SOFT	63
MILD	26
ROUGH	11
IRITATING	0
OTHERS	20
TOTAL	100



**Conclusion**

It is been concluded that PH test of the treated sample is found to be neutral

The softness of the treated sample is observed to be 52% and has a better order as well.

The customer satisfaction is also high .The softness (feel) of the fabric is also expressed more by the respondents.

As per the above observations and the findings the present study entitled “Designing nonwoven medical aids using natural medical finish for asthma patients “ was carried out and has come to the conclusion that the recommended finish is so good and can be recommended for other patients with similar difficulties in breathing.

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